

FLEXLAB

FACILITY FOR LOW ENERGY EXPERIMENTS IN BUILDINGS

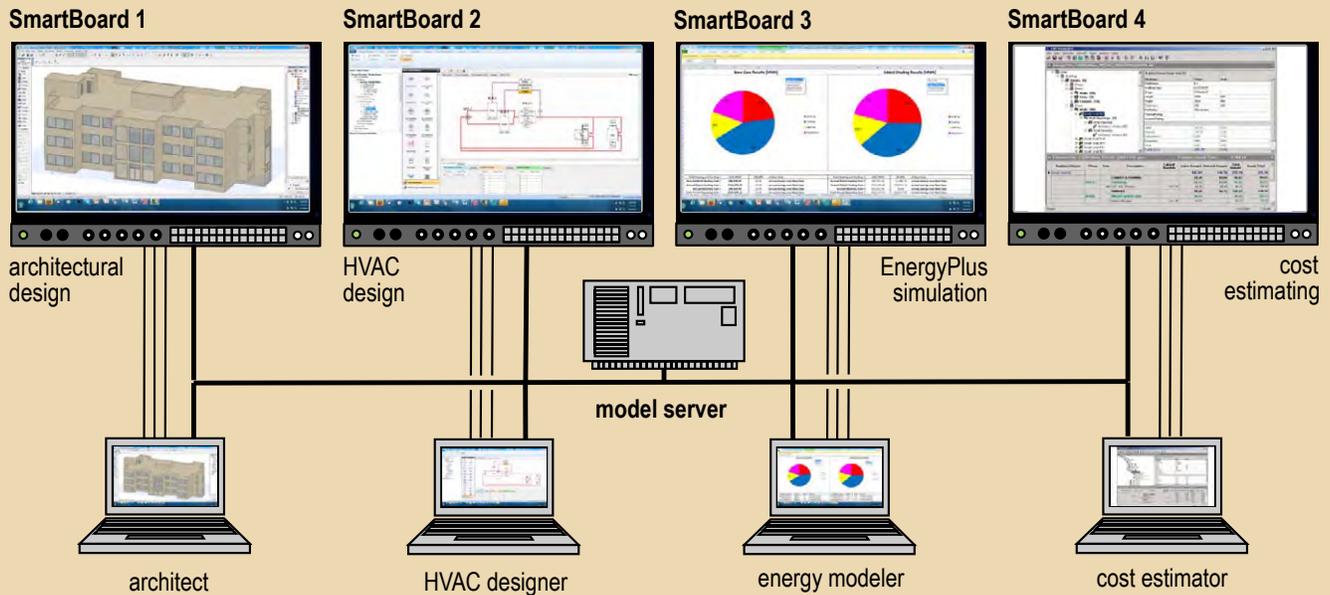


Figure 1: FLEXLAB Virtual Design Testbed setup for a collaborative design session.

FLEXLAB Virtual Design Testbed: Design and solve problems collaboratively

The challenge of optimizing building design to achieve highly energy efficient buildings, both in retrofit and new construction, requires more effective use of interoperable simulation tools. Most design teams do not have access to state-of-the-art software suites that support an integrated design process. The FLEXLAB Virtual Design Testbed will help the design community meet that need.

The FLEXLAB Virtual Design Testbed facilitates project design and development in a collaborative setting. Equipped with smartboards, which allow the facility's users to work interactively by displaying and modifying content from their laptops directly to screens visible throughout the room, the Virtual Design Testbed will allow participants who are present in the room, as well as those joining meetings remotely, to put up and modify ideas, share data, and develop designs collaboratively.

Multiple participants will be able to simultaneously use design tools such as EnergyPlus, Simergy, Radiance, EnergyIQ, and other DOE-developed tools, as well as commercial software such as Revit, ArchiCAD, SketchUp, DesignBuider and IES, for integrated simulation-based design, benchmarking, value engineering and life-cycle analysis of buildings. Using building simulation tools, designers can develop buildings with clear performance goals.

The Virtual Design Testbed can be used in many different ways. Figure 1 above illustrates how it can be used to effectively support collaborative design. The architect (or the core architectural team), the HVAC designer (or the core HVAC design team), the energy modeler (with critical modeling staff) and the cost estimator (with critical cost estimating staff) meet in the Virtual Design Testbed for a design session. Each is seated at a computer station connected to a SmartBoard (the "computer station" can be their own laptop), ready

to work on the project design within their own domains. Their work is displayed on the SmartBoard as it progresses, visible to everyone in the room. Since all computer stations are connected to the model server, data exchange among them is seamless, instantaneous and reliable. Participants see each other's work in progress, discuss it as it is taking place, immediately analyze the effects of design decisions on their own work, and make collaborative design decisions that satisfy all parties and are agreed to by all participants.

The use of the Virtual Design Testbed is limited only by one's imagination. It will readily support the following functions and processes:

- Collaborative planning and design;
- Architectural design;
- HVAC design;
- Electrical engineering design;
- Structural design;
- Fire safety design;
- Building safety and security;
- Building operations;
- Facilities management design;
- Life cycle analysis;
- Value engineering;
- Sustainable design;
- Buildings related research;
- Real time computational and display support of other FLEXLAB Testbed experiments.

Potential users of this Testbed are:

- Architecture/engineering firms;
- Builders and construction management firms;
- Building owners and operators;
- Utility companies;
- Code checkers;
- University and college faculty and students without access to iRooms;
- Anyone else participating in collaborative design of sustainable buildings.

The Virtual Design Testbed contains the following equipment and accommodation:

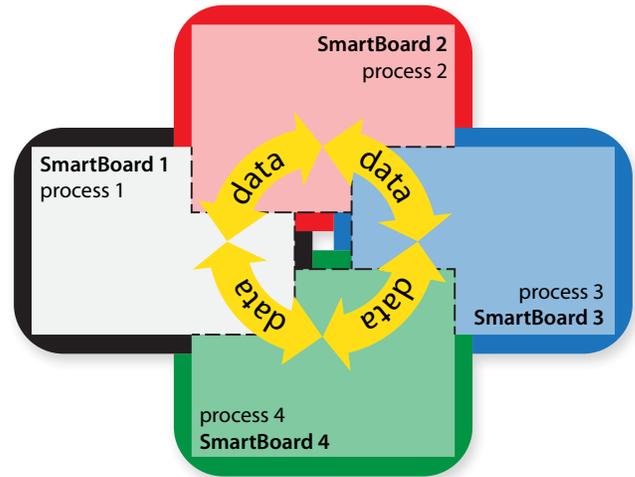


Figure 2: Process connectivity, data exchange and sharing in the FLEXLAB Virtual Design Testbed.

- Four SmartBoards;
- Four interchangeable workstations, connected together by a Testbed operating system;
- Full wireless Internet connectivity, common server;
- Seating for 30 people.

All SmartBoards are high-resolution screens that can display, capture and store displayed information, and users can post and modify virtual models, drawings, designs, and other information interactively. The Testbed's operating system will support direct and seamless data exchange and sharing among all SmartBoard users (Figure 2).

Berkeley Lab invites interested partners to contact FLEXLAB staff for more information about how to perform research with us in the new facility and demonstrate new technologies and systems that will help achieve aggressive new performance goals for America's building stock.

For additional technical information about the Virtual Design Testbed and the setup of possible experiments contact Dr. Vladimir Bazjanac at v_bazjanac@lbl.gov, (510) 486-4092.

Partnering opportunities: Flexlab.info@lbl.gov

Facility for Low Energy eXperiments in Buildings (FLEXLAB) website: <http://flexlab.lbl.gov>.

